Amendment to the Claims

In the Claims:

Please cancel Claims 25 and 26.

Please amend Claims 1-3, 8-10, 16-18, and 27, and add new Claims 29-43 as follows:

1. (Currently Amended) A method for identifying a specific cell, to enable a determination to be made as to whether the specific cell corresponds to a known cell type, comprising the steps of:

providing spatial frequency content data from a side scatter image of the known cell type;

directing incident light at [[a]] the specific cell, using a detector to obtain [[a]] the side scatter image of the specific cell; and

~~using~~ comparing the spatial frequency content of the side scatter image ~~to identify a~~ of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type.

2. (Currently Amended) The method of claim 1 wherein there is relative motion between the specific cell and the detector.

3. (Currently Amended) The method of claim 1 wherein [[a]] the specific cell ~~subpopulation~~ [[is]] identified ~~with~~ is contained within a heterogeneous cell population, and side scatter image data is collected for the heterogeneous cell population.

4. (Original) The method of claim 1 wherein the specific cell identified is an apoptotic cell.

5. (Original) The method of claim 4 wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell.

6. (Original) The method of claim 1 wherein the specific cell identified is a necrotic cell.

7. (Original) The method of claim 1 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

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LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

8. (Currently Amended) A method for identifying a specific cell, to enable a determination to be made as to whether the specific cell corresponds to a known cell type comprising the steps of:

providing spatial frequency content data from a brightfield image of the known cell type;

directing incident light at [[a]] the specific cell, using a detector to obtain [[a]] the brightfield image of the specific cell; and

~~using~~ comparing the spatial frequency content of the brightfield image ~~to identify a~~ of the specific cell to the spatial frequency content data of the brightfield image of the known cell type to determine if the specific cell corresponds to the known cell type.

9. (Currently Amended) The method of claim 8 wherein there is relative motion between the specific cell and the detector.

10. (Currently Amended) The method of claim 8 wherein [[a]] the specific cell ~~subpopulation~~ [[is]] identified ~~with~~ is contained within a heterogeneous cell population, and brightfield image data is collected for the heterogeneous cell population.

11. (Original) The method of claim 8 wherein the specific cell identified is an apoptotic cell.

12. (Original) The method of claim 11 wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell.

13. (Original) The method of claim 8 wherein the specific cell identified is a necrotic cell.

14. (Original) The method of claim 8 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

15. (Original) The method of claim 8 wherein the spatial frequency content is of the nucleus.

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

16. (Currently Amended) A method for identifying a specific cell, to enable a determination to be made as to whether the specific cell corresponds to a known cell type comprising the steps of:

providing an image of the known cell type that has been marked with a nuclear marker;

providing spatial frequency content data from the image of the known cell type that has been marked with the nuclear marker;

contacting [[a]] the specific cell with [[a]] the nuclear marker[[,]];

directing incident light at the marked specific cell[[,]];

using a detector to obtain an image of the marked specific cell[[,]]; and

~~using the nuclear marker~~ comparing the image of the marked specific cell and ~~in combination with the~~ a spatial frequency content of the [[cell]] image of the marked specific cell ~~to identify a~~ to the marked image of the known cell and the spatial frequency content of the marked image of the known cell type to determine if the specific cell corresponds to the known cell type.

17. (Currently Amended) The method of claim 16 wherein there is relative motion between the specific cell and the detector.

18. (Currently Amended) The method of claim 16 wherein [[a]] the specific cell ~~subpopulation~~ [[is]] identified ~~with~~ is contained within a heterogeneous cell population, and image data is collected for the heterogeneous cell population.

19. (Original) The method of claim 16 wherein the specific cell identified is an apoptotic cell.

20. (Original) The method of claim 19 wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell.

21. (Original) The method of claim 16 wherein the specific cell identified is a necrotic cell.

22. (Original) The method of claim 16 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

23. (Original) The method of claim 16 wherein a single nuclear marker is used.

24. (Original) The method of claim 16 wherein the single nuclear marker is 7-aminoactinomycin D.

25. (Cancelled)

26. (Cancelled)

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

27. (Currently Amended) A kit for use in a multispectral imaging system to identify a specific cell, comprising a single nuclear marker, wherein a cell is contacted with the single nuclear marker for a time sufficient to allow identification of an apoptotic cell or a necrotic cell with the multispectral imaging system using only a single nuclear marker.

28. (Original) The kit of claim 27 wherein the single nuclear marker is 7-aminoactinomycin D.

29. (New) A method for determining a viability status of a specific cell, comprising the steps of:

exposing the specific cell to a nuclear marker that will bind to DNA in a nucleus of the cell;

collecting a darkfield image of the specific cell;

collecting a brightfield image of the specific cell;

collecting a fluorescent image of the specific cell in which the nuclear marker is present; and

analyzing the fluorescent image and at least one of the brightfield image and the darkfield image to determine the viability status of the specific cell, wherein the viability status corresponds to one of the following:

a first status indicating that the specific cell is a viable cell;

a second status indicating that the specific cell is in a relatively early stage of apoptosis;

a third status indicating that the specific cell is in relatively late stage of apoptosis; and

a fourth status indicating that the specific cell is a necrotic cell.

30. (New) The method of claim 29 wherein the first status is characterized by a relatively larger cellular area as determined from the brightfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

31. (New) The method of claim 29 wherein the first status is characterized by a relatively lower scatter peak intensity as determined from the darkfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

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Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

32. (New) The method of claim 29 wherein the first status is characterized by a relatively larger cellular area as determined from the brightfield image, a relatively lower scatter peak intensity as determined from the darkfield image, and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

33. (New) The method of claim 29 wherein the second status is characterized by a relatively smaller cellular area as determined from the brightfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

34. (New) The method of claim 29 wherein the second status is characterized by a relatively higher scatter peak intensity as determined from the darkfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

35. (New) The method of claim 29 wherein the second status is characterized by a relatively smaller cellular area as determined from the brightfield image, a relatively higher scatter peak intensity as determined from the darkfield image, and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

36. (New) The method of claim 29 wherein the third status is characterized by a relatively smaller cellular area as determined from the brightfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

37. (New) The method of claim 29 wherein the third status is characterized by a relatively higher scatter peak intensity as determined from the darkfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

38. (New) The method of claim 29 wherein the third status is characterized by a relatively smaller cellular area as determined from the brightfield image, a relatively higher scatter peak intensity as determined from the darkfield image, and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

39. (New) The method of claim 29 wherein the fourth status is characterized by a relatively larger cellular area as determined from the brightfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

40. (New) The method of claim 29 wherein the fourth status is characterized by a relatively lower scatter peak intensity as determined from the darkfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

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600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314

41. (New) The method of claim 29 wherein the fourth status is characterized by a relatively larger cellular area as determined from the brightfield image, a relatively lower scatter peak intensity as determined from the darkfield image, and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

42. (New) The method of claim 29 wherein the step of analyzing the brightfield image comprises the step of determining if blebbing is present, blebbing being indicative of the second status and the third status, while lack of blebbing being indicative of the first status and fourth status.

43. (New) The method of claim 42 wherein the step of analyzing the fluorescent image comprises the step of determining if the nuclear marker is present in the cellular nucleus, such that:

when no blebbing is determined to be present by analyzing the brightfield image, and no nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that the viability status of the cell corresponds to the first status indicating that the specific cell is viable;

when blebbing is determined to be present by analyzing the brightfield image, and no nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that the viability status of the cell corresponds to the second status indicating that the specific cell is in a relatively early stage of apoptosis;

when blebbing is determined to be present by analyzing the brightfield image, and the nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that the viability status of the cell corresponds to the third status indicating that the specific cell is in a relatively late stage of apoptosis; and

when no blebbing is determined to be present by analyzing the brightfield image, and the nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that the viability status of the cell corresponds to the fourth status indicating that the specific cell is necrotic.

LAW OFFICES OF RONALD M. ANDERSON
600 - 108th Avenue N.E., Suite 507
Bellevue, Washington 98004
Telephone: (425) 688-8816 Fax: (425) 646-6314